

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A turbine engine component comprising:

an airfoil portion having a span;

at least one cooling passageway in said airfoil portion extending from a root portion of said airfoil portion to a tip portion of said airfoil portion; and

a plurality of turbulation promotion devices in said at least one cooling passageway, said turbulation promotion devices comprising a plurality of spaced apart pairs of arcuately shaped trip strips, said turbulation promotion devices having a P/e which varies along the span of said airfoil portion, where P is the pitch between adjacent ones of said turbulation promotion devices and e is the height of each said turbulation promotion device,

wherein the P/e ratio of said turbulation promotion devices is lower in a midspan region of said at least one cooling passageway than in an end region of said at least one cooling passageway and wherein said P/e ratio is in the range of from 5 to 30 in said midspan region.

2 - 3. (cancelled)

4. (currently amended) A turbine engine component ~~according to~~  
~~claim 2, comprising:~~

an airfoil portion having a span;

at least one cooling passageway in said airfoil portion  
extending from a root portion of said airfoil portion to a tip  
portion of said airfoil portion;

a plurality of turbulation promotion devices in said at  
least one cooling passageway, said turbulation promotion devices  
comprising a plurality of spaced apart pairs of arcuately shaped  
trip strips, said turbulation promotion devices having a P/e  
which varies along the span of said airfoil portion, where P is  
the pitch between adjacent ones of said turbulation promotion  
devices and e is the height of each said turbulation promotion  
device;

wherein the P/e ratio of said turbulation promotion devices  
is lower in a midspan region of said at least one cooling  
passageway than in an end region of said at least one cooling  
passageway, and

wherein said P/e ratio is in the range of from 5 to 30 in said end region.

5. (original) A turbine engine component according to claim 1, wherein said P/e ratio is lower in a midspan region of said at least one cooling passageway and is higher in non-midspan regions of said at least one cooling passageway.

6. (currently amended) A turbine engine component ~~according to claim 1, comprising:~~

an airfoil portion having a span;

at least one cooling passageway in said airfoil portion extending from a root portion of said airfoil portion to a tip portion of said airfoil portion;

a plurality of turbulation promotion devices in said at least one cooling passageway, said turbulation promotion devices comprising a plurality of spaced apart pairs of arcuately shaped trip strips, said turbulation promotion devices having a P/e which varies along the span of said airfoil portion, where P is

the pitch between adjacent ones of said turbulation promotion devices and e is the height of each said turbulation promotion device; and

wherein said pitch in a region near said root portion varies from 0.050 to 0.500 inches.

7. (original) A turbine engine component according to claim 1, wherein said pitch in a region near said root portion varies from 0.350 to 0.362 inches.

8. (currently amended) A turbine engine component ~~according to~~ ~~claim 1,~~ comprising:

an airfoil portion having a span;

at least one cooling passageway in said airfoil portion extending from a root portion of said airfoil portion to a tip portion of said airfoil portion;

a plurality of turbulation promotion devices in said at least one cooling passageway, said turbulation promotion devices comprising a plurality of spaced apart pairs of arcuately shaped

trip strips, said turbulation promotion devices having a P/e  
which varies along the span of said airfoil portion, where P is  
the pitch between adjacent ones of said turbulation promotion  
devices and e is the height of each said turbulation promotion  
device; and

wherein said pitch in a mid-span region varies from 0.050 inches to 0.500 inches.

9. (original) A turbine engine component according to claim 1, wherein said pitch in a mid-span region varies from 0.110 to 0.180 inches.

10. (currently amended) A turbine engine component ~~according to~~ ~~claim 1,~~ comprising:

an airfoil portion having a span;  
at least one cooling passageway in said airfoil portion  
extending from a root portion of said airfoil portion to a tip  
portion of said airfoil portion;

a plurality of turbulation promotion devices in said at least one cooling passageway, said turbulation promotion devices comprising a plurality of spaced apart pairs of arcuately shaped trip strips, said turbulation promotion devices having a P/e which varies along the span of said airfoil portion, where P is the pitch between adjacent ones of said turbulation promotion devices and e is the height of each said turbulation promotion device; and

wherein said pitch in a region near said tip portion varies from 0.050 inches to 0.500 inches.

11. (original) A turbine engine component according to claim 1, wherein said pitch in region near said tip portion varies from 0.180 inches to 0.290 inches.

12. (currently amended) A turbine engine component ~~according to~~ ~~claim 1,~~ comprising:

an airfoil portion having a span;

at least one cooling passageway in said airfoil portion  
extending from a root portion of said airfoil portion to a tip  
portion of said airfoil portion;

a plurality of turbulation promotion devices in said at  
least one cooling passageway, said turbulation promotion devices  
comprising a plurality of spaced apart pairs of arcuately shaped  
trip strips, said turbulation promotion devices having a P/e  
which varies along the span of said airfoil portion, where P is  
the pitch between adjacent ones of said turbulation promotion  
devices and e is the height of each said turbulation promotion  
device; and

wherein said height varies from 0.004 inches to 0.050 inches.

13. (original) A turbine engine component according to claim 1,  
wherein said height varies from 0.008 inches to 0.010 inches.

14. (previously presented) A turbine engine component according  
to claim 1, wherein said turbine blade has a plurality of  
cooling passageways, each said cooling passageway having a  
plurality of turbulation promotion devices, and said turbulation

promotion devices in each of said cooling passageways having a P/e ratio which varies along the span of the airfoil portion.

15. (original) A turbine engine component according to claim 1, wherein said component comprises a turbine blade.

16. (currently amended) A turbine engine component ~~according to claim 1, comprising:~~

an airfoil portion having a span;

at least one cooling passageway in said airfoil portion  
extending from a root portion of said airfoil portion to a tip  
portion of said airfoil portion;

a plurality of turbulation promotion devices in said at  
least one cooling passageway, said turbulation promotion devices  
comprising a plurality of spaced apart pairs of arcuately shaped  
trip strips, said turbulation promotion devices having a P/e  
which varies along the span of said airfoil portion, where P is  
the pitch between adjacent ones of said turbulation promotion  
devices and e is the height of each said turbulation promotion  
device; and

wherein said at least one cooling passageway has a diameter D and the ratio of e/D is in the range of 0.05 to 0.30.

17 - 18. (cancelled)

19. (previously presented) A method for manufacturing a turbine engine component comprising:

forming a component having an airfoil portion with a root portion, a tip portion and a span;

fabricating at least one cooling passage in said component having a plurality of turbulation promotion devices having a P/e ratio which varies along the span of said component, where P is the pitch between adjacent ones of said turbulation promotion devices and e is the height of a respective turbulation promotion device;

said fabricating step further comprising providing a first region of each said cooling passage adjacent said root portion of said airfoil portion with turbulation promotion devices having a first P/e ratio and providing a mid span region of each said cooling passage with turbulation promotion devices having a second P/e ratio which is lower than said first P/e ratio; and

said fabricating step further comprising providing a third region of each said cooling passage adjacent said tip portion of said airfoil portion with turbulation promotion devices having a third P/e ratio which is greater than said second P/e ratio.

20. (original) A method according to claim 19, wherein said fabricating step further comprises providing said third P/e ratio so that it is greater than said first P/e ratio.

21. (currently amended) A method according to claim 17 19, wherein said turbine component forming step comprises forming a turbine blade.

22. (currently amended) A method according to claim 17 19, wherein said turbine component forming step comprises forming said turbine engine component by a casting technique.

23. (previously presented) A turbine engine component comprising:

an airfoil portion having a span;

at least one cooling passageway in said airfoil portion extending from a root portion of said airfoil portion to a tip portion of said airfoil portion; and

a plurality of turbulation promotion devices in said at least one cooling passageway, said turbulation promotion devices having a P/e which varies along the span of said airfoil portion, where P is the pitch between adjacent turbulation promotion devices and e is the height of each said turbulation promotion device;

each said cooling passageway having a first region adjacent said root portion of said airfoil portion with a plurality of said turbulation promotion devices having a first P/e, a mid

span region having a plurality of said turbulation providing devices having a second P/e ratio which is lower than said first P/e, and a third region adjacent said tip portion of said airfoil portion with a plurality of said turbulation promotion devices having a third P/e ratio which is greater than said second P/e ratio.

24. (previously presented) A turbine engine component according to claim 23, wherein said third P/e ratio is greater than said first P/e ratio.

25. (previously presented) A turbine engine component according to claim 1, wherein said turbulator promotion devices have a surface at an angle with respect to a flow of cooling fluid through a respective one of said cooling passageways.

26. (previously presented) A turbine engine component according to claim 25, wherein said angle is in the range of from 30 to 70 degrees with respect to the flow.